

## CLAIMS

1. Imager sequential illumination system  
5 comprising:

- a source emitting towards the imager a polychromatic light beam in the wavelength range comprising at least three primary colours,

- a device for scrolling coloured segments  
10 comprising at least three transmissive or reflective segments, the said scrolling device making it possible to scroll the said segments over the optical path of the said polychromatic light beam so that they successively cut the direction of propagation of the said beam in the  
15 case where the segments are transmissive, or so that they successively reflect the said beam in the case where the segments are reflective, the said segments being of different colours and each having a hue, a saturation, a transmissivity or a reflectivity, and a size that are  
20 suitable for obtaining a beam exhibiting a reference hue when they scroll sequentially through the said zone of transmission of the beam,

characterized in that the coloured segments are distributed in the said scrolling device in an order such  
25 that the differences of energies perceived by the visual system of a standard observer (visual stimuli), during the intersegment transitions, when the segments scroll over the optical path of the said beam, are the least variable possible.

2. Illumination system according to Claim 1, characterized in that the coloured segments are distributed in an order such that the sum of the said differences of energies perceived by the visual system of an observer during the various transitions between successive segments, is minimized.

3. Illumination system according to Claim 2, characterized in that the scrolling device comprises several segments of like colour so as to reduce the mean differences of excitation energies by distributing them over several intersegment transitions.

4. Illumination system according to Claim 3, characterized in that the scrolling device comprises a different number of segments of primary or recompounded colours so as to reduce the mean differences of excitation energies by distributing them over several intersegment transitions.

5. Illumination system according to any one of the preceding claims, characterized in that the said device for scrolling coloured segments comprises a colour wheel comprising at least three transmissive or reflective segments, the said wheel being mounted on means of rotation so as to scroll the said segments over the said optical path of the said light beam.

6. Method of design of a colour wheel for an imager colour sequential illumination system, the said wheel comprising at least three transmissive and/or reflective segments, the said segments being of different or identical colours and each having a hue, a saturation, a transmissivity or a reflectivity, and a size that are suitable for obtaining a beam exhibiting a reference hue

when they scroll sequentially through a zone of transmission of an illumination beam, characterized in that it comprises a step of measuring the excitation energies induced by the various segments in the visual system of an observer and a step of distributing the coloured segments over the said colour wheel in an order such that the differences of successive excitation energies of the visual system of a standard observer (visual stimuli), during the intersegment transitions, when the segments scroll through the said transmission zone are the least variable possible.

7. Method according to Claim 5, characterized in that for a colour wheel furnished with a determined number of segments each having a determined dimension and making it possible to obtain a determined global colour temperature, the distributing of the segments over the said wheel is carried out in such a way that the sum of the said differences of energies perceived by the visual system of an observer, when the segments scroll through the said transmission zone, is the lowest possible.

8. Device of coloured segments comprising a plurality of juxtaposed zones of different colours making it possible to provide, by illumination of the various zones, beams of different colours, characterized in that the said zones of different colours are arranged in an order such that when they are successively illuminated according to the said order, the differences of energies perceived by the visual system of a standard observer (visual stimuli), during the interzone transitions, when the illumination passes from one zone to the next zone, are the least variable possible.

9. Device of coloured segments according to Claim 8, characterized in that the said zones of different colours are arranged in an order such that the sum of the said differences of energies perceived by the visual  
5 system of an observer during the various transitions between successive zones, is the lowest possible.

10. Device of coloured segments according to one of Claims 8 or 9, characterized in that it comprises a colour wheel.